EXPLANATION OF SIGNIFICANT DIFFERENCE

HAGEN FARM SUPERFUND SITE
GROUNDWATER CONTROL OPERABLE UNIT
DANE COUNTY, WISCONSIN

I. Introduction

The Hagen Farm Site (the Site) is located at 2318 County Highway A, approximately one mile east of the City of Stoughton, Dane County, Wisconsin. The Site is defined as the area within the Hagen Farm property boundary and the contaminant plume. The property is approximately 28 acres in size. Within the property boundary is approximately 10 acres of disposal area. The Site, as a whole, is situated in a rural surrounding that is dominated largely by sand and gravel mining and agriculture.

The City of Stoughton's municipal wells are located approximately two miles to the west. Three private wells are located approximately 1,000 feet west of the Site, and eight private wells are located within 4,000 feet downgradient from the Site. Approximately 350 people reside within one mile of the Site.

Regionally, the Site is located in the Yahara River watershed, in an area of flat to gently rolling topography. The Yahara River is located approximately 1.3 miles to the west and flows in a southerly direction. The Site does not lie within the 100-year flood plain. The only substantial surface-water bodies in the area are Sundby's pond located approximately ½ mile south of the Site and the Yahara River. An on-site ditch is located at the southeast corner of the property which flows to a wetland. This wetland is located directly south of the Site. There is no designated Wisconsin State significant habitat, or historic landmark site directly or potentially affected. No endangered species are known to inhabit the Site.

II. Requirement to Address Significant Change

The lead enforcement agency (in this case, the United States Environmental Protection Agency [U.S. EPA]) may determine that a significant change to the selected remedy described in the Record of Decision (ROD) may be warranted after the ROD is signed. Section 117(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), requires that:

> After adoption of a final remedial action plan (ROD) -
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> (1) if any remedial action is taken,
> (2) if any enforcement action under section 106 is taken, or

> (3) if any settlement or consent decree under section 106 or section 122 is entered into,
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> and if such action, settlement, or decree differs in any significant respects from the final plan, the U.S. EPA shall publish an explanation of the significant differences (ESD)and the reasons such changes were made. (42 U.S.C. §9617(c))

In this case, the U.S. EPA, after appropriate consultation with the Wisconsin Department of Natural Resources (WDNR), has determined that an ESD is appropriate to explain and document modifications made to the performance standards detailed in the ROD. The modifications resulted from information gathered during the Remedial Design and Remedial Action (RD/RA) phases of this action. This ESD document and all of the technical information and data relating to it shall become part of the administrative record for the Site, which is available for viewing at the Dunkirk Town Hall and Stoughton Public Library in Stoughton, Wisconsin, during normal business hours.

III. Background

A. Site History

The Site was operated as a sand and gravel pit prior to the late 1950s. The gravel pit was then used for disposal of waste materials from the late 1950s to the mid-1960s. The property was purchased from Nora Sundby by Orrin Hagen in November 1977. The Site is currently owned by Waste Management, Incorporated Midwest (WMIM). The Site was operated by City Disposal Corporation. City Disposal Corporation was subsequently purchased by WMIM. City Disposal was also the transporter of much of the waste that was deposited at the Site.

Waste solvents and other various organic materials, in addition to the municipal wastes, were disposed of at the Site, including acetone, butyl acetate, 1-2-dichloroethylene, tetrahydrofuran (THF), solid vinyl, sludge material containing methyl ethyl ketone and xylenes, and toluene. The Site stopped accepting waste in 1966, prior to regulation of hazardous waste disposal by Resource Conservation and Recovery Act (RCRA) Subtitle C.

Beginning in November 1980, in response to complaints received from local residents, the WDNR began conducting groundwater sampling at nearby private water supply wells. Sampling of the on-Site monitoring wells during the period 1980-1986 indicated certain organic compounds were present in the groundwater, including benzene, ethylbenzene, THF, xylenes, and toluene.

In addition, nearby private water supplies on adjacent properties also contained detectable levels of volatile organic compounds (VOCs). The private wells located on adjacent properties had been impacted by acetone, THF, vinyl chloride, xylene, trans-1,2-dichlorethene, and trichloroethylene.

The Site was proposed for inclusion on the National Priorities List (NPL) on September 18, 1985. The Site was placed on the NPL in July 1987. Subsequently, WMIM and Uniroyal, the two potentially responsible parties (PRPs) named by U.S. EPA in connection with the Site, entered into an Administrative Order by Consent (the Consent Order) with U.S. EPA and WDNR. In the Consent Order, WMIM and Uniroyal agreed to conduct a Remedial Investigation and Feasibility Study (RI/FS) at the Site. Accordingly, in July 1988, upon U.S. EPA approval, in consultation with the WDNR, the required work plans, and fieldwork at the Site commenced.

During the RI, two operable units (OUs) were defined for the Site. OU I, the Source Control Operable Unit (SCOU), was intended to address waste refuse and sub-surface soils (waste/sub-soils). OU II, the Groundwater Control Operable Unit (GCOU), was intended to address the contaminated on- and off-property groundwater at the Site. For purposes of this ESD, "on-property groundwater" is defined as contaminated groundwater on and in the immediate vicinity of the main waste disposal area and "off-property groundwater" is defined as contaminated groundwater at any location within the plume other than in the area defined as on-property groundwater. The OU approach was agreed upon after discussions among U.S. EPA, WDNR, and the PRPs during the early phase of the implementation of the work plan for the RI. This ESD is developed for the GCOU, which is OU II.

The ROD for the SCOU was signed on September 17, 1990. An ESD was issued in April 1991. The ROD called for consolidating three waste disposal areas into one area, capping the consolidated waste, and installing and operating of an In-Situ Vapor Extraction (ISVE) system. The ESD provided guidance on the development of cleanup goals for the ISVE system. Waste consolidation and capping were completed in May 1992. The ISVE system was installed in January 1993 and is currently operational.

The RI/FS for the GCOU was finalized in April 1992. The RI for the GCOU presented the nature and extent of contamination in the groundwater and evaluated possible exposure pathways. In general, the report included the following conclusions concerning contamination at the Site: 1) The contaminants causing the most concern in groundwater were VOCs. The most prevalent VOC in groundwater was THF with a maximum detected concentration of 630,000 parts per billion (ppb) (current State cleanup standard is 10 ppb); 2) The occurrence, concentration, and distribution of

THF suggested that there was a THF plume originating from the disposal area and it extended downgradient (south) approximately 3,600 feet; 3) VOCs were not detected in samples collected from private wells during the investigation; 4) the results of a treatability study indicated the THF and other VOCs in groundwater could be effectively treated using activated biological sludge; and 5) groundwater posed an unacceptable risk to human health, primarily from the potential ingestion of contaminated groundwater near the Site under current- and future-use scenarios.

After reviewing the results of the RI/FS, U.S. EPA issued a ROD for the Site on September 30, 1992. From October 1992 to April 1996, one PRP (WMIM), under U.S. EPA and WDNR oversight, performed the RD/RA phases of the project, as described in the ROD.

B. Record of Decision

The selected remedy for the Site included the following major components:

- Monitoring of all private wells located around the Site;
- Pre-treatment of extracted on- and off-property groundwater;
- Extraction and treatment of groundwater;
- Treatment of on-property groundwater using Activated Sludge Biological Treatment;
- Treatment of off-property groundwater using a treatment technology to be determined during the design phase;
- Discharge of treated groundwater to wetlands or the Yahara River;
- Treatment and disposal of sludges generated from the groundwater treatment and treatment of off-gas emitted from the treatment process;
- Deed and access restrictions to prevent installation of drinking water wells within the vicinity of the disposal areas and off-property; and
- Implementation of a bench scale study to determine the effect of nutrients and/or oxygen on contaminated groundwater. If the bench scale study shows positive

results, a pilot study would be conducted, with the ultimate goal of enhancing the selected remedy with an in-situ groundwater bioremediation system.

IV. Significant Difference

The purpose of this document is to explain three (3) modifications to the selected remedy, as presented in the ROD. Information obtained during the RD and/or RA phases of the work at the Site necessitated these modifications. The three ROD performance standards and the necessary modifications are presented below.

1) **ROD Performance Standard:** The ROD specified that the treated groundwater will be discharged to the Yahara River or nearby wetlands. The ROD also specified that discharge to these locations would require meeting substantive requirements or complying with the requirements of a Wisconsin Pollutant Discharge Elimination System (WPDES) permit, State groundwater standards, and/or State wetlands protection policies. Meeting or complying with these requirements would require a variety of technical investigations and tests such as a wetlands investigation and effluent toxicity tests.

   Modification: During design, the decision was made by U.S. EPA, in consultation with the WDNR, to allow treated groundwater to be discharged back into the ground, on-site, and near upgradient of the capped waste disposal area instead of the Yahara River or wetlands. Discharge to the ground will be accomplished through an infiltration gallery. The final design for the infiltration gallery was approved in January 1996.

   This decision was primarily based on hydrogeological information presented in the RI, groundwater modeling done during the RD, and tests conducted during the design such as laboratory bench scale infiltration tests and in-field pilot studies. Hydrogeological information presented in the RI indicated that a potential existed for the effective use of an infiltration gallery at the Site. Modeling and tests showed that the native material can very easily absorb water discharges at rates and volumes estimated for the treatment system at the Site. In addition, modeling indicated that infiltration of treated water upgradient of the contaminated plume may expedite the cleanup by helping to flush contaminants through the ground into

the pumping wells and by potentially enhancing biodegradation of the groundwater contamination through the introduction of oxygen. Other decision factors include significantly less disruption to the local community from construction activities and lower construction costs for on-Site discharge of treated groundwater compared to the Yahara River and/or wetlands discharge locations. Also, regulatory requirements associated with a discharge to the Yahara River and/or wetlands, such as compliance with a WPDES permit and wetlands investigation, will no longer be required. Compliance with the substantive requirements of the WPDES permit is still required for use of the infiltration gallery.

2) **ROD Performance Standard:** Although not specifically stated, the ROD has been interpreted to require separate on- and off-property treatment facilities for on- and off-property groundwater extraction systems.

Modification: During design, the decision was made by U.S. EPA, in consultation with the WDNR, to allow groundwater extracted from on- and off-property locations to be combined into one treatment stream and be treated at one location (on-property). Results presented in the RD Treatability Study Report indicated that combining the two waste streams into one treatment facility was technically more efficient and less costly than building two treatment facilities at the Site.

3) **ROD Performance Standard:** The ROD specified that contaminated on-property groundwater was to be treated using activated biological sludge (ABS). ABS was also to be evaluated for treatment of contaminated off-property groundwater.

Modification: During design, the decision was made by U.S. EPA, in consultation with the WDNR, to allow groundwater extracted from on- and off-property locations to be treated using fixed film biological treatment (FFBT). FFBT is essentially the same as ABS, but uses a media such as small plastic balls to allow the biological component (bacteria) of the treatment process to stick to and be "fixed" in place. Results presented in the RD Treatability Study Report indicated that application of this form of biological treatment at the Site would produce less treatment wastes than ABS and, in general, be more technically manageable, reliable, and efficient.

V. Affirmation of Statutory Determinations

U.S. EPA believes that the remedy as modified in this ESD remains protective of human health and the environment, complies with federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy utilizes permanent solutions to the maximum extent practicable for this Site.

VI. State Comment

The State of Wisconsin was consulted regarding these changes and has reviewed this ESD. The State agrees that the modifications to the selected remedy are necessary and appropriate.

VII. Public Participation Activities

This ESD and other documents related to this project are available for public review at the Dunkirk Town Hall and Stoughton Public Library in Stoughton, Wisconsin during normal business hours.

William E. Muno, Director
Waste Management Division

8/27/81
Date